

REMARKS

The Office Action dated August 4, 2008_has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-33 and 35-4 are currently pending in the subject application, including independent claims 1, 29, 37, and 38-41. In particular, Applicants here amend claims 1, 7, 15, 29 and 37-38 and add new claims 39-41. It is respectfully submitted that the claim amendments and additions add no new subject matter to the present application and serve only to better particularly point out and distinctly claim the subject matter that Applicants regard as the invention. Applicants urge that all grounds for rejection in the Office Action have been addressed and that the present application is currently in condition for allowance in view of the claim amendments, and the following explanations. Reconsideration of claims 1-33 and 35-41 are respectfully requested.

Claim Objections

As an initial observation, Applicants wish to express great appreciation for the indication given in the Office Action that claims 7, 15, 20, and 21 are objected to as depending from rejected claims but would be allowable if rewritten in independent form. Applicants here added new claims 39-41 the correspond, respectively, to allowable claims 7, 15, and 20 written in independent form. Consideration and allowance of claims 39-41 are respectfully requested for at least the reasons provided in the Office Action.

Rejection under 35 U.S.C. 102(b)

Claims 1-3, 22-23, and 26-38 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by over U.S. Patent No. 5,233,628 (Rappaport). Withdrawal of this rejection is respectfully requested for at least the reasons presented in the following discussion.

As an initial observation, Applicants note that this rejection incorrectly includes claim 34, now cancelled.

Applicants further note claim 22 is not discussed in this rejection, and the Office Action at page 13 admits that Rappaport does not anticipate this claim. Reconsideration and allowance of claim 22 on at least these basis are respectfully requested. Furthermore, Applicants note that due to this clear error and failure to present a prima facie rejection, any future office action rejecting claim 22 must be non-final since rejection would not be necessitated by an amendment to claim 22 or other triggering event. See MPEP 706.07.

Applicants further respectfully submit that Rappaport fails to disclose or suggest all of the limitations of any of the pending claims.

Independent claim 1, from which claims 2-28 depend, is directed to a method in which at least one transmit diversity branch is determined in an operational entity of a communications network. The determined one transmit diversity branch is used based on estimated channel properties of at least two transmit diversity branches from a transmitter.

Independent claim 29, from which claims 30-33 and 35-36 depend, is directed to an apparatus that includes an establisher configured to establish estimated channel properties of at least two transmit diversity branches. A determiner in the apparatus of claim 29 is configured to determine, in an operational entity of a communications network, transmit diversity branches for use, based on the estimated channel properties.

Independent claim 37 is directed to an apparatus that includes an establishing means for establishing estimated channel properties of at least two transmit diversity branches. The apparatus further includes a determining means for determining, in an operational entity of a communications network, transmit diversity branches for use, based on the estimated channel properties.

Independent claim 38 recites a computer program embodied on a computer readable medium. The computer readable medium storing code includes computer executable instructions configured to determining, in an operational entity of a communications network, at least one transmit diversity branch. The determined transmit diversity branches are used based on estimated channel properties of at least two transmit diversity branches from a transmitter.

Applicants submit that each of the above claims recites limitations that are neither disclosed nor suggested in Rappaport.

As described in Applicants' Response of July 30, 2008, certain embodiments of the present invention relate to determining at least one transmit diversity branch for use, as needed to obtain diversity gain.

In contrast, Applicants urge that Rappaport does not relate to transmit diversity. As depicted in Rappaport at FIG. 2 and the supporting specification, this cited reference generally relates to a communications stimulation system that allows a user to perform a quantitative or subjective test of digital baseband devices over wireless channels using actual measured or modeled propagation data. The digital wireless communication simulation system of Rappaport is capable of simulating the transient nature of channels and radio hardware so that loss of synchronization can be included in the simulation. The simulator is a combination of computer software and hardware that computes a convolution, in the time domain, of a sequence of binary digits or data symbols (i.e., the data stream) with a computer model of a radio transmitter, a propagation channel or channels and a receiver. The software in Rappaport computes a bit-by-bit sequence for replay at a later time. Once stored, the bit-by-bit error sequence can be clocked through a hardware data port and compared with an applied data stream in real time. The output of the hardware data port is a real time sequence of bits that has errors due to the bit-by-bit simulation computed earlier by the software.

In this way, Rappaport discloses a simulation system to enable an evaluation of the performance of various baseband platforms using a range of diversity approaches before implementing a diversity approach in a prototype. See, for example, Rappaport at col. 16, ll. 20-34.

Applicants respectfully urge that Rappaport does not relate, in any way, to transmit diversity. As well known in the field of communications and as described in the

present application, transmit diversity techniques require two or more transmit diversity branches from a single transmitter. The branches should be as uncorrelated as possible in order to maximize the diversity. See, for example, paragraph [0002] of the present application. Thus two uncorrelated, or largely uncorrelated, signals carrying effectively the same information will be received. See, for example, paragraph [0003] of the present application. Diversity can be obtained, for example, through multipath diversity, receiving antennae diversity, macro diversity, etc. Applicants respectfully note that the simulation system described in Rappaport does not include disclosure relevant to transmit diversity, as recited in claim 1, and therefore, Rappaport cannot disclose or suggest the limitation in claim 1 of “determining ... at least two transmit diversity branches of a transmitter.”

Moreover, even if it could be argued that the simulation system in Rappaport discloses transmit diversity (not admitted), Applicant note that Rappaport, at best, relates to implementing a predefined transmit diversity scheme that is determined during network planning and cannot be adapted to changing channel and network situations (and therefore cannot “discover” a diversity branch). In this way, as described in present application at paragraphs [0004] and [0006], certain recited embodiments provide significant benefits over the disclosure in Rappaport.

Moreover, Rappaport does not teach or suggest that its disclosed simulation system includes an operational entity of a wireless communications network, as described, for example, at paragraph [0028] of the present application. Accordingly,

Rappaport cannot teach or suggest that the limitation in claim 1 that the determining is in an operational entity of a wireless communications network. Instead, Rappaport specifically discloses at col. 1, line 12, that that simulation system is to evaluate performance in a laboratory.

Therefore, claim 1 is allowable over Rappaport since this reference does not disclose every recited limitation of the claim; the rejection should therefore be withdrawn. Reconsideration and allowance of claim 1 in view of these arguments are respectfully requested. Likewise, claims 2-28 depend from claim 1 and should be allowable over Rappaport on similar grounds. Reconsideration and allowance of claims 2-28 in view of these arguments are further respectfully requested.

Independent claims 29, 37, and 38, although of different scope from claim 1, contain similar recitations and should be allowed on similar grounds. Likewise, claims 30-33 and 35-36 depend from either claims 29 or 34 and should be similarly allowable. Reconsideration and allowance of claims 29-38 in view of these arguments are further respectfully requested.

Based at least on the above, Applicants submit that Rappaport fails to disclose or suggest all of the limitations of claims 1-3, 22-23, and 26-38. Accordingly, withdrawal of the rejection under 35 U.S.C. 102(b) is respectfully requested.

Claim Rejection under 35 U.S.C. §103(a)

The Office Action rejected claim 4 under 35 U.S.C. 103(a) as being obvious over Rappaport, in view of U.S. Patent No. 6,097,956 (Veeravalli). The Office Action took the position that Rappaport disclosed the limitation of claim 4 except that the “determining” comprises taking into account a required outage probability. The Office Action then asserted that Veeravalli disclosed this limitation. Applicants respectfully submit that the cited references, taken individually or in combination, fail to disclose or suggest all of the limitations of any of the above claims. Specifically, Rappaport is deficient at least for the reasons discussed above regarding claim 1, and Veeravalli fails to cure these deficiencies at least for the reasons discussed herein.

As described in Applicants’ Response of July 30, 2008, Veeravalli is directed to calculation of the probability of outage for a cell within a CDMA network is utilized to relate cell coverage to cell capacity. Based on a desired probability of outage, the coverage of the cell may be calculated for an average number of users within the cell. The calculation is independent of the admission policy employed to achieve the specified average number of users. The resulting closed form expression for the tradeoff between coverage and carried traffic allows an optimal design of a CDMA network.

Thus, Veeravalli fails to cure the deficiencies of Rappaport because Veeravalli, in no way, discloses or suggests the limitation in claim 1 of “determining, in an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit diversity branches.” Based at least on the above discussion, Applicants submit that the cited references of Rappaport and

Veeravalli fail to disclose or suggest all of the limitations of claim 1. Claim 4 is therefore similarly allowable over Rappaport and Veeravalli for at least its dependency from claim 1, as well as for the separate recitations in claim 4. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

The Office Action rejected claims 5, 6, 8, 10 and 11 under 35 U.S.C. 103(a) as being obvious over Rappaport, in view of U.S. Patent No. 5,524,275 (Lindell). Referring, for example, to claim 5, the Office Action took the position that Rappaport disclosed the limitations of independent claim 1 but fails to disclose the limitation of determining the transmit diversity branch(es) based on estimated channel properties such as expected powers of transmit diversity branches. The Office Action then asserted that Lindell disclosed this limitation. Applicants submit that the cited references of Rappaport and Lindell, whether considered individually or in combination, fail to disclose or suggest all of the limitations of any of the pending claims. Specifically, Rappaport is deficient at least for the reasons discussed above regarding claim 1, and Lindell fails to cure these deficiencies at least for the reasons discussed herein.

As described in Applicants' Response dated July 30, 2008, Lindell is directed to a radio transmitter output power controller which automatically restricts the maximum transmitting time during an averaging time so that the average power remains below an acceptable level. The maximum transmitter output power in Lindell may be automatically reduced to a lower level if and when a predetermined average power level

is approached. A warning signal may be generated in Lindell to inform a user that the maximum permitted power output is being approached.

However, Lindell provides no disclosure related to transmit diversity and therefore fails to disclose or suggest the limitation in claim 1 of “determining, at an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit diversity branches.”

Thus, Lindell fails to cure the above-described deficiencies of Rappaport, and claim 1 is allowable of these references individually or in combination. Claims 5, 6, 8, 10 and 11 are therefore allowable over Lindell and Rappaport for at least their dependency from claim 1, as well as for the separate recitations in these dependent claims. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

Claim 9 is rejected under 35 U.S.C. 103(a) as being obvious over Rappaport and Lindell, in further view of U.S. Patent No. 6,415,283 (Conklin). The Office Action took the position that Rappaport and Lindell disclosed the limitations of claim 8 and Conklin discloses the additional limitations recited in claim 9, such as evaluating a transmit diversity performance indicator for transmit diversity branch sets using a tree structure, such that a transmit diversity branch set relates to a child node having less transmit diversity branches than a transmit diversity branch set relating to a parent node of the child node. Applicants submit that the cited references of Rappaport, Lindell, and

Conklin, when considered individually or in combination, fail to disclose or suggest all of the limitations of any of the pending claims. Specifically, Rappaport and Lindell are deficient at least for the reasons discussed above, and Conklin fails to cure these deficiencies.

As described above, Rappaport and Lindell fail to disclose each and every limitation of claim 1.

Conklin does not cure the deficiencies in Rappaport and Lindell. Specifically, as described in Applicants' Response of July 30, 2008, Conklin is directed to a cluster processing system that determines at least one focal node on a hierarchically arranged tree structure of nodes based on attributes of a data set. The data set in Conklin comprises a plurality of data set attributes with associated weight values. The cluster processing system selects a set of nodes from the tree structure with tree structure attributes that correspond with the data set attributes, and then assigns quantitative values to nodes in the set of nodes from the weight values in the data set. At least one cluster of nodes is selected, based on proximity in the tree structure, and at least one focal node on the tree structure for the cluster of nodes is selected. The focal node comprises an attribute most representative of the data set attributes.

In this way, Conklin also fails to disclose or suggest the limitation of "determining, at an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit diversity branches." Thus, Conklin fails to cure the deficiencies of Rappaport and

Lindell, and claim 1 is allowable over Lindell, Rappaport, and Conklin. Claim 9 is therefore allowable over the cited combination of references for at least its dependency from claim 1, as well as for the separate recitations in this dependent claim.

Based at least on the above, Applicants respectfully submit that the cited references fail to disclose or suggest all of the limitations of claim 9. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

The Office Action further rejected claims 12-14, 16, 18 and 19 under 35 U.S.C. 103(a) as being obvious over Rappaport, in view of U.S. Patent No. 5,956,649 (Mitra). Referring, for example, to claim 12, the Office Action took the position that Rappaport disclosed the limitations of claim 1 and Mitra disclosed the additional limitation most of determining the at least one transmit diversity branch for use based on estimated channel properties comprising second order statistics of channel coefficients of transmit diversity branches. Applicants submit that the cited references of Rappaport and Mitra, whether considered individually or in combination, fail to disclose or suggest all of the limitations of claims 12-14, 16, and 18-19. Specifically, Rappaport is deficient at least for the same reasons discussed above regarding claim 1, and Mitra fails to cure these deficiencies at least for the following reasons.

As described above, Rappaport fails to disclose each and every limitation of claim

1. Applicants urge that Mitra does not cure the deficiencies in Rappaport.

As described in Applicants' Response of July 30, 2008, Mitra is directed to using a set of parameters characterizing an interference signal at a base unit for determining power levels for signals transmitted from a communications device to the base unit. The set of parameters comprises second or higher order statistics characterizing the interference signal, and the parameters are used to determine a desired power level for signals received at the base unit. In Mitra, the desired power level is communicated to a communications device via a pilot signal transmitted by the base unit at a predetermined level. The predetermined level and the power of the received pilot signal are used to compute a path gain between the base unit and communications device. The path gain and desired power level are then used in Mitra to determine the power level of signals transmitted from the communications device to the base unit.

However, Mitra fails to disclose or suggest the limitation of "determining, at an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit diversity branches." Thus, claim 1 is allowable over Lindell and Mitra. Claims 12-14, 16, and 18-19 are therefore allowable over this cited combination of references for at least their dependency from claim 1, as well as for the separate recitations in these dependent claims. Based at least on the above, Applicants respectfully submit that the cited references fail to disclose or suggest all of the limitations of claim 12-14, 16, 18 and 19. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

The Office Action further rejected claim 17 under 35 U.S.C. 103(a) as being obvious over Rappaport and Mitra, in further view of Conklin. The Office Action took the position that Rappaport and Mitra disclosed all of the limitations of claim 16 and Conklin disclosed the additional limitations of 17, including evaluating a transmit diversity performance indicator for transmit diversity branch sets using a tree structure such that a transmit diversity branch set relating to a child node has less transmit diversity branches than a transmit diversity branch set relating to a parent node of the child node. Applicants respectfully submit that the cited references of Rappaport, Mitra, and Conklin, taken individually or in combination, fail to disclose or suggest all of the limitations of any of the above claims.

Specifically, Rappaport, Mitra, and Conklin are deficient at least for the reasons discussed above. Specifically, claim 1 is allowable over this cited combination of references that do not teach or suggest at least the limitation of “determining, at an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit diversity branches.”

Thus, claim 1 is allowable over Lindell, Mitra, and Conklin. Claim 17 is therefore also allowable over this cited combination of references for at least its dependency from claim 1, as well as for the separate recitations in this dependent claim. Based at least on the above, Applicants submit that the cited references fail to disclose or suggest all of the limitations of claim 17. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

The Office Action further rejected claims 24 and 25 under 35 U.S.C. 103(a) as being obvious over Rappaport in view of U.S. Patent No. 6,317,411 (Whinnett). The Office Action took the position that Rappaport disclosed all of the limitations of claims 24 and 25 except for estimating channel properties using channel coefficients at a transmitter or estimating channel properties using channel coefficients at a receiver. The Office Action then asserted that Whinnett disclosed these limitations. Applicants respectfully submit that the cited references, taken individually or in combination, fail to disclose or suggest all of the limitations of any of the above claims. Specifically, Rappaport is deficient at least for the reasons discussed above, and Whinnett fails to cure these deficiencies.

As described above, Rappaport fails to disclose each and every limitation of claim 1. Whinnett does not cure the deficiencies in Rappaport.

As described in Applicants' Response of July 30, 2008, Whinnett is directed to reducing the effect of multipath fading. According to Whinnett, a stream of symbols to be transmitted is received at a "commutator." The commutator in Whinnett sends alternate symbols to one spreader and the other symbols to another spreader. Two antennas, each connected to one of the spreaders, then transmit the spread symbols. Characteristics of the path that the signals follow from each antenna are measured in Whinnett using a pilot signal at a receiver, and are described by channel coefficients. The received symbols are respectively multiplied by a value derived from the coefficient for the path on which the

symbols were transmitted. In Whinnett, transmit power is reduced for the same quality of service because different symbols experience different gains, which lowers the likelihood that a pair of consecutive symbols will simultaneously experience a deep fade.

Applicants respectfully submit that Whinnett fails to disclose or suggest at least the limitation of “determining, at an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit diversity branches,” as recited in claim 1. According to Whinnett, all (that is both) branches are always used since different symbols are transmitted over each branch. Thus, Whinnett is silent with regards to a determination of transmit diversity branches since neither of the branches in Whinnett is excluded. See, for example, Figures 1 to 3 in Whinnett.

Thus, claim 1 is allowable over Lindell and Whinnet. Claims 24-25 are therefore allowable over this cited combination of references for at least their dependency from claim 1, as well as for the separate recitations in these dependent claims. Based at least on the above, Applicants respectfully submit that the cited references fail to disclose or suggest all of the limitations of claim 25. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

The Office Action indicates at page 13 that claims 24 and 25 were also rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Rappaport in view of U.S. Patent No. 7,039,368 (Brunner). Applicants note that this rejection appears to be in error

because the rejection does not include any analysis of claims 24 and 24. Accordingly, Applicants urge that a prima facie rejection has not been presented and this rejection must be withdrawn.

Applicants further urge that even if a proper rejection is presented, the combination of Rappaport and Brunner does not teach or suggest each and every limitation of any of the pending claims. As described above, Rappaport does not teach or suggest all of the limitations in any of the pending claims. Brunner does not cure these deficiencies in Rappaport.

Brunner generally relates to controlling a downlink beam in a radio communication system. The radio communication system in Brunner includes an antenna system with several antenna elements. Specifically, Brunner discloses examining a received uplink signal sent by a transmitter for the existence of phase correlations between parts of the uplink signal received from various antenna elements of the antenna system, and then, if a phase correlation is detected, assigning at least one source direction to the uplink signal and sending the downlink signal in the source direction. If a phase correlation is not detected in Brunner, the downlink signal is sent in a non-directional manner in the form of several components produced using at least one diversity technique.

Thus, Brunner also fails to disclose or suggest the limitation in claim 1 of “determining, at an operational entity of a wireless communications network, at least one transmit diversity branch for use based on estimated channel properties of transmit

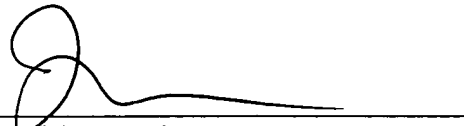
diversity branches.” Thus, claim 1 is allowable over Lindell and Brunner. Claims 24-25 are therefore also allowable over this cited combination of references for at least their dependency from claim 1, as well as for the separate recitations in these dependent claims. Based at least on the above, Applicants respectfully submit that the cited references of Lindell and Brunner fail to disclose or suggest all of the limitations of claim 24-25. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

As discussed above, each of the pending claims 1-33 and 35-41, including independent claims 1, 29, 37, and 38-41, recites subject matter which is neither disclosed nor suggested in the cited references. Applicants submit that the recited subject matter is more than sufficient to render the invention non-obvious to a person of ordinary skill in the art. It is respectfully requested that independent claims 1, 29, 37, and 38-41 and the related dependent claims be allowed in view of the above arguments, comments, and remarks and that the present application be allowed to pass to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants’ undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'David D. Nelson', written over a horizontal line.

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Enclosures: Additional Claim Fee Transmittal
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